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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,047	10/29/2001	Yuan Gao	208-6164	1829
7590	03/16/2004		EXAMINER	
F. Michael Sajovec Myers Bigel Sibley & Sajovec Post Office Box 37428 Raleigh, NC 27627			KALAFUT, STEPHEN J	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/040,047	GAO ET AL.
	Examiner	Art Unit
	Stephen J. Kalafut	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 01 December 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 2-98 is/are pending in the application.
- 4a) Of the above claim(s) 23-30,44, 54, 65, 66, 70, 71, 74, 88, 89 is/are withdrawn from consideration.
- 5) Claim(s) 95-97 is/are allowed.
- 6) Claim(s) 2-22,31,35-41,43,45-53,55,56,60-64,67-69,72,73,75-87,90-94 and 98 is/are rejected.
- 7) Claim(s) 32-34,42 and 57-59 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3 separate dates.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

Claims 23-30, 44, 54, 65, 66, 70, 71, 74, 88 and 89 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 12/1/03.

Claims 62-64, 67-69, 72, 73, 75-87 and 90-94 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 62 is confusing because it recites the production of two separate phrases, one of the compound of Li and M¹ and the other of Li₂M²O₃, but does not recite any precursor bearing M² as part of the original mixture. Claims 63, 64, 67-69, 72, 73, 75-88 and 90-97 depend from claim 62 and would likewise be indefinite. Claim 62 also does not recite what metals M² may be. Any dependent claim also not specifying any metal(s) for M² would also be indefinite for this reason.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2-4, 6-22, 31, 36-39, 41, 43, 45-53, 55, 56, 61 and 98 are rejected under 35 U.S.C. 102(e) as being anticipated by Thackeray *et al.* (US 6,677,082).

Thackeray *et al.* disclose a cell with a two-phase cathode material, where one phase is LiMO_2 , where M includes at least one of Ni, Fe, Co, Ti, V, or Mn (column 1, lines 42-62), and the other is a “rocksalt” phase $\text{Li}_2\text{M}'\text{O}_3$, where M' may be Ti or Zr (column 2, lines 65 through column 3, line 10). Some compounds within the LiMO_2 formula include compounds in which Ni is the principle metal, with dopants such as Co, Al, Ti or Mg, where the average valence for the metals is 3, although the dopants Mg and Ti have different valences (column 1, lines 57-62). Since M' may be one or more of Ti and Zr, a third oxide may be present, corresponding to the compound “further” comprised by the active material, in claims 31 and 56. Since Ti and Zr are the same atoms as presently recited, they would also have the same Pauling's electronegativity value. Ti may be present both as a dopant within M, or as the metal M'.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thackeray *et al.* (US 6,677,082).

These claims differ from Thackeray *et al.* by reciting the relative portions of the two compounds. However, because Thackeray *et al.* teach that LiMO_2 is electrochemically active, while the rocksalt phase $\text{Li}_2\text{M}'\text{O}_3$ is not (column 3, lines 17-26), the relative amounts of each would have an effect on the capacity of the electrode, and thus be recognized as a result-effective

variable. It would thus be obvious for the ordinary artisan to optimize the amounts of the two phases disclosed by Thackeray *et al.*

Claims 35 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thackeray *et al.* in view of Saidi *et al.* (US 6,103,419).

Thackeray *et al.* do not disclose a binder or a carbonaceous material mixed in with their active material. Saidi *et al.* disclose mixed metal oxide cathode materials, and teach that these may be mixed with carbon and a polymeric binder (column 3, lines 23-25). These would provide electrical conductivity and mechanical strength. For these reasons, it would be obvious to add to the cathode material of Thackeray *et al.* the carbon and polymeric binder of Saidi *et al.*

Claims 32-34, 42 and 57-59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art applied above, or cited either below or by applicants, does not disclose a cathode material with the recited two compounds, and a third compound being the metal oxides of claims 32-34 and 57-59, nor one in which the active compound has a formula based on LiM^1_2O_4 , along with the $\text{Li}_2\text{M}^2\text{O}_3$ compound.

Claims 95-97 are allowed. The method of making the two-part cathode material, where one compound comprises Li, Ni, Co, one of Ti and Zr, and one of Mg, Ca, Sr and Ba; and the other compound is $\text{Li}_2\text{M}_3\text{O}_3$, where M is Ti or Zr; which method includes mixing and reacting precursors at the recited temperatures; is not disclosed by the prior art.

Claims 62-64, 67-69, 72, 73, 75-88 and 90-94 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. These claims also recite the mixing and reaction temperatures which are not disclosed by the prior art.

The disclosure is objected to because of the following informalities: Applicants should provide, when known thereto, the final status (Patent No. or abandonment) of the applications mentioned on pages 2 and 16 of the specification. Appropriate correction is required.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gao *et al.* (US 2002/0197533) disclose the present active compound as a single active material. Takami *et al.* (US 6468693), Barker *et al.* (US 2003/0073001), Tsujimoto *et al.* (US 2002/0012842), and Kweon *et al.* (US 2001/0031397) disclose various mixed metal oxide cathode active materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjk



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP

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